

File
1-48

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DIVISION OF SAFETY OF DAMS

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of dam: Oroville Dam No.: 1-48 County: Butte
Type of dam: Earthfill Type of Spillway: Gated Concrete weir & chute
Water is 17.5 feet below spillway crest and 125.9 feet below dam crest.
*Elevation 883.5
Weather conditions: Cloudy, cool, rain and windy
Contacts made: Martin Wolf and Alex Samaan
Reason for inspection: Periodic evaluation

Important Observations, Recommendations or Actions Taken:

Housekeeping in galleries poor. Inspection of Bloomer Hill Slide needed. Spillway Bridge wall spalling due to lack of bearing pads, adequate bearing remains and will be watched. River Outlet valves tested annually. Prestressed tendon testing completed, report delayed. Looked at report on corrosion investigation of radial gate struts. O&M climbing team inspected gates found and marked numerous missing welds. O&M considering abandoning twin tube devices in Terminal S and sealing entrance. Some instrumentation gages need changing at the core block AB Joint in House T and Terminal S. Seepage weirs need regular cleaning to be accurate. Drains onto the upstream face from the sewer/water conduits in the dam crest have missing screens and need UV protection. Recommend a memo detailing work items and requesting a schedule for completion.

Conclusions: From the known information and the visual inspection the dam, reservoir and appurtenances are judged satisfactory for continued use.

Observations and Comments:

Dam Main Dam The recent overlay on the crest has started to crack reflecting those observed in the previous pavement. The cracks should be sealed. The exposed portion of the upstream face with an uneven, heavy riprap cover is in good condition. Drains from the carrier conduit for the water and sewer pipes buried in the dam crest need attention. Many of the screened fitting for the ends of the pipes have been removed and should be replaced. It appears that the public has pulled them off. It was suggested that an internal screen would be less prone to vandalism. Also the exposed drain pipes need some protection from ultraviolet exposure. I asked that they be painted. The downstream slope was viewed from the crest and toe and points on both abutments. The slope has a low grass cover, is uniform and appears stable. The right gallery was entered and traveled to the core block and Terminal S. Exit was up the right gallery, down the emergency exit tunnel into the River Outlet and back to the power house.

Typed by: RJB
Date: 01/24/00
cc: USFS, COE, Owner

Inspected by: R. J. Baines
Date of Inspection: 01/12/00
Date of Report: 01/24/00
Photos taken: Yes ☐ No ☒

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Observations and Comments (Continued)

The concrete in the galleries remains sound but housekeeping is needed for assessment and safety. The right gallery continues to deteriorate like that observed on the left last spring. Seepage flows run down the walls or come up from drains and flow across the walkways. Precipitates from seepage have build up on any surface that is wetted. The steps have thick coatings of deposits that make footing uneven and is becoming hazardous, (I stumbled once). Also ground wiring, tubing and other piping or equipment anchored to the gallery walls are being encrusted with deposits. Some cleaning of the walls was done around 1992 but is very much needed again. Deposits on the floors have never been cleared. After cleaning the water needs to be directed into the drains and not allowed to flow over the walls and floors/steps. Drainage gutters are almost clogged with deep growths of iron bacteria or black magnesium deposits. Messrs. Samaan and Wolf said that work items have been turned over to Civil Maintenance for many years as action items but the work is never accomplished. I recommend sending a memorandum detailing needed work and requesting a schedule.

Bidwell Bar Canyon Saddle Dam and Parish Camp Saddle Dam These dams were not inspected this time. They will be inspected during the next inspection scheduled for the spring.

Spillway The approach was open. All the radial gates were closed. The visible concrete in the gate structure, top part of the chute, and emergency weir remains in satisfactory condition.

Slow spalling continues beneath the road bridge, with recent spalls evidenced by missing red paint. Mr. Wolf requested an extension ladder so the remaining support could be determined. Mr. Wolf said that the cause of the spalling has been determined to be from movement of the bridge deck on the top of the abutment walls. There are no bearing pads so friction, probably from changing temperatures, spalls the edges of the support. The original support is 11 inches deep and we measured 5.5 inches of spalling in the worst location at the downstream right side of the bridge. Calculations show that 6 inches of bearing are required. At the worst location there is 6.5 inches of bearing. Overall we estimated that 3+ inches has been lost. Soon it will be time to design a fix.

Mr. Wolf said that an inspection of the spillway chute was made in the fall and he found some drummy patches. No treatment is proposed until they are damaged by a heavy flow.

The gates were viewed from the various decks and appear satisfactory except for needed coating renewal. The O&M inspection team inspected the gates in October and found numerous missing welds along the strut diagonal bracing. Most of the

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Observations and Comments (Continued)

missing welds were in the sharp V on the under side of a strut where the diagonal and vertical bracing intersect. Welds on the other three sides of the tubing were mostly satisfactory. The recommendation of the climbing team was to complete the welding, adjust seals and re-coat the gates. DSOD has not been provided a copy of that report. Maintenance was underway on the cables, tensioning and routine procedures. The trunnions and trunnion beams look okay. The pre-stressed anchor rods were sealed and covered under the plastic weather proof boxes. The ends of the anchors are clean and dry. The gate hoisting motors are in the midst of servicing. The emergency weir was viewed from the top flood control spillway structure and no distress was noted.

Sonic thickness measurements of all the structural steel tubing struts were made near the bottom of the strut where corrosion would be expected to occur if water had found its way into the interior of the box section. All four sides were measured near their connecting point to the horizontal girders and three feet away from the girders. The results were that minimum thickness for the 0.5 inch top and bottom sides was 0.495 inches, which is within the milling tolerances. The minimum for the 0.75 inch sides was 0.745 inches, again within tolerances. The conclusions were that there is no loss of section due to corrosion. A copy of the report is being furnished for our records.

The report on the sonic testing of the prestressed tendons, done last summer, has been delayed for a few months.

Outlet Two generators one were on line with a flow of 9,133 cfs. The river outlet valves are closed. They are operational but not used. The guard valves, the Howell-Bunger valves and the operating equipment appear to be in good condition. Modifications are underway to the ball valves. New gages and oil pumping equipment is being added/replaced on the valves. Mr. Wolf reported that the valves are all cycled once per year as requested by the Director's five year consulting board. Mr. Wolf said that the standard operating procedure is to follow that frequency, except for the period the valves were de-commissioned. The intake structure was not visited.

The Palermo Tunnel was inspected. The tunnel remains in good condition. The butterfly and cone valves are well maintained. The butterfly valve was fully open and the cone valve partially open releasing 2.9 cfs.

Seepage Rain prevented assessment of spillway drain leakage, although there was little water from the drains because of the low reservoir level. The lower end of the spillway and the lower

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drains were not visited. At the Toe Seepage House there was ~13 gpm from the orifice. In the left gallery seepage was first encountered at Elevation 798, less than 1 gpm. The normal seepage pattern was evident in the galleries and from the drains in the Emergency Exit Tunnel. The weirs read yesterday but Mr. Wolf found that deposits on the very sharp V notches were raising the water level indicating a higher flow than the actual. The weir surfaces need to be cleaned thoroughly and then brushed clean before each reading. House T leakage from the instrument tubing was ~1 gpm. There was minor leakage in the Palermo Outlet tunnel.

Instrumentation The replaced crack gage in the spillway headworks shows no movement. The crest monuments appear to be in good shape. At Terminal S the tubing for the settlement devices and the piezometers in the core block continue to age. Housekeeping is difficult in this area. Turbidity measurements continue to be made on the leakage. The piezometers and fluid level settlement devices are failing slowly. The few functional gages were not recorded. The five foundation piezometers, not part of the bundled tubing, are still functional. Mr. Wolf said that O&M is considering cutting off the tubing and installing the plug to end the use of the failing instruments. I agree. A study will be made or run by DOE. At the grouted AB joint in Monolith 14 the gages were read and two of the gages have a range of 100 psi. The gages were close to the limit. These gages need to be replaced with ones with 200 or 300 psi maximum readings.

At House T there are 16 twin tube piezometer or fluid level settlement devices that are still being monitored. The gages have leakage deposits on them and some need replacement. The mounting terminal is dirty as well as the whole house. Similarly, House U which only houses a seismic device needs attention.

Field Division personnel are still reading temperature and stress meter devices but headquarters O&M does not use the readings. These instruments were installed to record the temperatures and stresses in the first few years of service. The information was used but no longer required. Mr. Wolf suggested that readings be discontinued.